Evaluation of anti-arthritic activity of formulation of polyherbal extract of *Tanacetum parthenium (L.), Salix tetrasperma Roxb.* and *Aloe barbadensis Mill.*

A Synopsis

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Supervised by

Jv'NDr.Dharmendra Ahuja

Submitted by

Dinesh Kumar

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Department of Pharmaceutical Sciences

Faculty of Pharmaceutical Science

JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY (JVWU)

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➢ INTRODUCTION

Medicinal plants have been a valuable source of natural active phyto-consituents that play an important role in treatment of many human diseases. This is mainly because these herbs/plants are relatively economical, easily available and their uses were decided on ancestral experience. In addition, synthetic drugs are not only expensive and inadequate for the treatment of disease, but are also faced with adulteration and side effects. Therefore, medicinal plants have been useful in the development of new drugs and continue to play valuable role in the drug discovery process. Arthritis is a chronic, inflammatory, systemic autoimmune disease characterized by pain, swelling and stiffness.

Various allopathic medications have been prescribed to alleviate symptoms of this disease which results into associated side effects like heart attack, stroke, stomach ulcers, bleeding from the digestive tract, and kidney damage etc. Hence the use of herbal medicine is becoming popular due to toxicity and side effects of allopathic medicines.

➢ HYPOTHESIS

Rheumatoid arthritis is very common disease and various synthetic drug are available for the treatment of rheumatoid arthritis but they have some side effect. Therefore number of medicinal plants are screened for arthritic potential but not fully explored. So, the study will be conducted on those medicinal plants which are not fully studied for anti-arthritic activity.

This study evaluated the anti-arthritic activity of a herbal formulation used in the management of arthritis. They were divided into seven groups of seven rats each, with Group A serving as negative control while Group B was the positive control. Groups B, C, D and E were induced with arthritis by extracted formulation. The rodent were treated with the standard drug and herbal formulation respectively for 14 days as follows: Group C (treated with a standard drug), Group D (treated with the herbal drug), Group E (treated with a combination therapy of extracted formulation . At the end of the 14-day significantly reduced LD50 value in the treated rats compared to the positive control group. The combination therapy used in this study did not offer significantly different therapeutic advantage over the monotherapies used in this study. The herbal formulation used in this study offered similar therapeutic activities as the arthritic drug used in this study. Conclusion: The herbal formulations can be used as safe therapies for the management of arthritis in our population. It is recommended that herbal formulations be integrated into our healthcare system in the management of arthritis.

➢ REVIEW OF LITERATURE

Antinociceptive and anti-inflammatory effects

Oral administration of the Tanacetum parthenium extract led to significant antinociceptive and anti-inflammatory effects against acetic acid-induced writhing in mice and carrageenan-induced paw edema in rats, dose-dependent (10, 20, 40 mg/kg, p.o.). Parthenolide (1, 2 mg/kg i.p.), produced antinociceptive and anti-inflammatory effects. [1]

Antibacterial Activity

DPPH scavenging activity was 59.3% of the oil from Davutpasa at 15mg/mL concentration. When compared to positive control α-tocopherol (94.6%) Savsat oil (28.2%) showed low and Davutpasa oil showed medium DPPH scavenging activity. All of the oils showed toxicity to Vibrio fischeri in the TLC-bioluminescence assay. [2]

Against root extract showed insignificant activity. In insecticidal study, the root and leaves extract of Salix tetrasperma showed moderate activity with 26% and 20% mortality rate of Tribolium castaneum at a dose of 50mg/ml in 48 hours, respectively and bark extract had no activity. [3]

Cytotoxicity Activitiy

Extract of leaves, barks and roots of Salix tetrasperma. against five Gram-positive and four Gram-negative bacteria with a zone of inhibition 12 ± 0.02 mm. In respect of in vivo cytotoxicity, Root and bark extract showed moderate cell growth inhibition, whereas leaves extract had no activity at all. [3]

Antimicrobial activity

Salix tetrasperma Roxb. belongs to the family Salicaceae. Leaf extract of S. tetrasperma. was carried out by maceration process. Antibacterial activity was evaluated by agar well diffusion method against 4 Gram positive and 4 Gram negative bacteria. Among Gram positive and Gram negative bacteria, S. epidermidis and P. aeruginosa displayed highest susceptibility to extract respectively. [4]

Antifungal activity

Antifungal activity was determined against 4 seed-borne fungi by poisoned food technique. The extract exhibited concentration dependent activity against test bacteria. Inhibition of test fungi by extract was concentration dependent. Among fungi, marked and least susceptibility to extract was shown by Rhizopus sp. and Cladosporium sp. respectively. [5]

Antioxidant Potential

Aloe contained significantly higher levels of polysaccharides and flavonoids than two- and four-year-old Aloe. The antioxidant activity of Aloe extracts exhibited the strongest radical scavenging activity of 72.19%, which is significantly higher than that of BHT at 70.52% and α-tocopherol at 65.20%. [6]

Analgesic activity

Evaluate the in vivo anti-arthritic effect of polyherbal formulation of selected plants Polygonum glabrum, Canthium dicoccum, Ochna obtusata, and Argyreia nervosa with In vivo anti-arthritic activity of the ethanolic extract of different portions capsule formulation F4 investigated orally was assessed using complete Freund's adjuvant-induced arthritis. Results: In complete Freund's adjuvant-induced arthritis models, the polyherbal extract formulations significantly ($P < 0.001$) reduced joint and paw swelling and markedly improved body weight, hematology profile, and parameters in complete Freund's adjuvant model. Ethanolic extract of two different formulations holds anti-arthritic potential, supporting its traditional use in the treatment of RA. [7]

➢ AIM AND OBJECTIVE

Objectives:

- Phytochmical investigation and standardization of selected plant extracts.
- In-vitro antioxidant activity of extracts.
- Acute oral toxicity study of selected plant extract.
- To prepare formulation of plant extracts for checking anti-arthritis potential.
- To evaluate in-vivo pharmacological screening techniques for anti-arthritis activity.
- To screen anti-arthritis potential of various herbal plant extracts.
- To evaluate in- vivo pharmacological screening in for flowing groups

  Group A- Negative Control

  Group B- Positive Control

  Group C- Treated with a standard drug X

  Group D- Treated with Extracted formulation

- To evaluate in- vivo pharmacological screening in doses groups.

  5 mg extract/kg body weight

  50 mg extract/kg body weight

  300 mg extract/kg body weight

  2000 mg extract/kg body weight

- The acute pharmacological study of extract will be evaluated periodically during the first 24 hrs and thereafter day for 14 days.

➢ METHODOLOGY

The methodology of research work will be selected on the basis of literature survey as follows:

1. Collection, Identification and Authentication of plant material
2. Pharmacognostic evaluation of plant material
3. Processing of plant material
4. Extraction of plant material
5. Phytochemical screening of plant material
6. Phytochemical qualitative analysis of selected plant extract will be carried out by preliminary phytochemical test i.e presence of Carbohydrates, Tannin, Alkaloids, Glycosides, Flavonoides, Steroids, Amino acid and proteins etc.
7. Phytochemical quantitative analysis of extract: The total phenolic & flavonoids content will be determined by phytochemical quantitative analysis.
8. Pharmacological screening of plant extracts for anti-arthritic activity by animal model as per reference standard methods.
9. Interpretation of data and its presentation.

➢ REFERNCE

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